UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,878	08/22/2001	Shao-Hua Guo	01-2580A	9259

24114 7590 01/14/2003

LYONDELL CHEMICAL COMPANY
3801 WEST CHESTER PIKE
NEWTOWN SQUARE, PA 19073

EXAMINER	
PRICE, ELVIS O	

ART UNIT	PAPER NUMBER
1621	8

DATE MAILED: 01/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/934,878	GUO ET AL.	
	Examiner	Art Unit	
	Elvis O. Price	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claims 1-18 are pending in the application.

Information Disclosure Statement

The information disclosure statement, filed 1/3/02, complies with the provisions of 37 CFR 1.97, 1.98 and MPEP02 § 609. It has been placed in the application file, and the information referred to therein has been considered as to the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5-7, and 9-12 rejected under 35 U.S.C. 102(b) as being anticipated by Guo {US Pat. 5,475,073}.

Guo discloses a process for making an acrylic polyol (hydroxy-functional acrylate resin), said process being performed in the absence of styrene, methyl acrylate and methyl methacrylate, comprising:

(a) charging a reactor with an allylic alcohol (allyl alcohol), an alkyl acrylate (25% of the total amount of n-butyl acrylate to be used) and a free-radical initiator;

(b) heating the reactor contents to a temperature of 135^0 C; and

(c) gradually adding to the reactor the remaining acrylic monomer and initator (see Example 3).

Guo discloses that the acrylic polyol prepared, in Example 3, has a number average molecular weight of 1560 and a weight average molecular weight of 4800, which constitutes a molecular weight distribution of 3.07. Guo's acrylic polyol of Example 3 has a hydroxyl number of 120 mg KOH/g.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2-4, 8, and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guo {US Pat. 5,475,073}, in view of Guo et al. {US Pat. 6,127,500} and further view of Aldrich (Catalog Handbook of Fine Chemicals, 1992-1993).

Applicants claim a process for making an acrylic polyol, said process being performed essentially in the absence of styrene, methyl acrylate and methyl methacrylate, and comprising:

(a) charging a reactor with an allylic alcohol, 0-75% of the total amount to be used of a C2-C20 alkyl or aryl acrylate or methacrylate monomer and 0-100% of the total amount to be used of a free-radical initiator;

(b) heating the reactor contents to100-250^0 C or to reflux; and

(c) gradually adding to the reactor the remaining acrylic monomer and initator; wherein the acrylic monomer has a boiling point the same as or higher than the allylic alcohol.

Guo teaches a process for making an acrylic polyol, comprising copolymerizing an allylic alcohol or propoxylated allylic alcohol with a C_1 to C_{20} alkyl or aryl acrylate or methacrylate monomer in the presence of a free-radical initiator (Col. 3, lines 53-60). Guo teaches that the reaction temperature of their process is generally from about 60^0 C to about 300^0 C (Col. 4, lines 40-45) and all or some of the acrylic monomer(s) and initiator of the Guo process are gradually added during the course of the reaction (see Col. 3, lines 61-67; Col. 4, lines 27-31 and Example 3). Guo teaches that allyl alcohol and methallyl alcohol are the preferred allylic alcohols used in his invention and that mono- or di-propoxylated allylic alcohols of the general formula, CH_2=CR-CH_2-$(A)_n$-OH (R is Hydrogen or C1-C5 alkyl; A is an oxypropylene group and n is less than or equal to 2), are also preferred (Col. 2, lines 32-47). In Example 3 of the Guo reference, the acrylic monomer (which is n-butyl acrylate; boiling point equals 145^0 C (Aldrich; pp. 225)) has a higher boiling point than that of the allylic alcohol (which is allyl alcohol; boiling point equals 96-98^0 C (Aldrich, pp. 37)). The difference between the presently claimed invention and what is taught in the Guo reference is that the Guo reference is silent with regard to, (1) heating the reactor contents to reflux, (2) the free-radical initiator containing less than 30 weight percent of water, (3) total monomer conversion of greater than 90%, and (4) acrylic polyol(s) having a molecular weight distribution less than about 2.5. However, since the Guo teaches a process for preparing acrylic polyols from reacting allyl alcohols and acrylic monomers, under reaction conditions which anticipate or encompass the presently claimed reaction conditions (e.g., broad reaction temperature range up to 300^0 C, type and amount of monomer used, type of

initiator, etc.), it would be reasonable for one having ordinary skill in the art to expect that the heating of the reactor contents to reflux (considering that the boiling points of allyl alcohol and n-butyl acrylate are well below 300^0 C), obtaining a total monomer conversion of greater that 90% and producing acrylic polyol(s) having a molecular weight distribution less than about 2.5 would be realized from Guo's invention (generally taught process for preparing acrylic polyols). Additionally, di-tertiary-butylperoxide is used as the free-radical initiator in Example 3 of Guo's invention. Di-tertiary-butylperoxide (98% solution) is a commercially available solution that contains less that 30% of water (Aldrich, pp. 237).

Guo et al. (US Pat. 6,127,500) teach that the acrylic polyol resins prepared in the US Pat. 5,475,073, cited above, have low molecular weights and molecular weight distributions less than 3. Guo et al. teach that the said acrylic polyol resins disclosed in US Pat. 5,475,073 are valuable reactive intermediates for making high-performance coatings and other thermoset polymers (see Col. 1, lines 41-57 of 6,127,500 patent).

It would have been *prima facie* obvious to one having ordinary skill in the art, in view of the Guo and Guo et al. references, to prepare acrylic polyols as presently claimed because Guo teaches a process for preparing acrylic polyols from reacting allyl alcohols and acrylic monomers in the presence of a free-radical initiator, wherein the acrylic monomers used are C_1 to C_{20} alkyl or aryl acrylate or methacrylate monomers, heating the reactants at from about 60^0 C to 300^0 C before gradually adding to the reaction mixture the remaining acrylic monomer and initator.

One having ordinary skill in the art would have been motivated, in view of the teachings in the Guo (US pat. 5,475,073) and Guo et al. (US Pat. 6,127,500) references, to prepare acrylic polyols as presently claimed because the skilled artisan would have been motivated to optimized the reaction conditions of the Guo process to affect optimum monomer conversion so as to afford an optimum yield of acrylic polyol product. The skill artisan, desiring to prepare acrylic polyol resins that are valuble intermediates for making high-performance coatings and other thermoset polymers, would have also been motivated to vary the reaction parameters of the Guo process so as to afford other art recognizable acrylic polyol resins having low molecular weights and molecular weight distributions less that 3. The instantly claimed invention would have been therefore obvious to one having ordinary skill in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elvis O. Price whose telephone number is 703 605-1204. The examiner can normally be reached on 8:30 am to 5:00 pm; Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 703 308-4532. The fax phone numbers for the organization where this application or proceeding is assigned is 703 308-4556.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-1235.

Elvis O. Price

January 12, 2003